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Non-final Office Action

Serial No. 08/984,059 - Att. Docket No.

2743-0104P

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EXAMINER

ALPHONSE, FRITZ

ART UNIT	PAPER NUMBER
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2675

DATE MAILED: 03/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

08/984,059

Applicant(s)

SONG

Examiner

Fritz Alphonse

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on interview of 28 June, 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-8, 11, 12 and 16-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-8, 11, 12 and 16-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 07 December 2000 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. This action is in response to the interview held on 6/28/00. Claims 1, 3, 11, 12, 19, 27 and 31 were discussed. In the interview, Applicant's Representative argued that neither Fowler et al (U.S. Pat. No. 5,616,269) or Marcade et al (U.S. Pat. No. 4,646,528) teach a "bi-directional data signal line" or "determine the right of transmission or "a serial communication line through a hole of a hinge in the appliance door". It was agreed that neither of these references disclosed the above features, therefore the final office action mailed 4/26/00 will be withdrawn and the application claims reconsidered.

Drawings

2. The proposed drawing correction filed on 2/7/00 has been disapproved because the corrected drawing (figures 1-3) which showed changes in form of a pen-and-ink sketch in red ink was not signed by Applicant and could not be entered. See MPEP § 608.02(v). Therefore, the requirement to designate figures 1-2 as Prior Art and to correct figure 3, has not been overcome.

Figures 1-2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Further, figure 3, item 224 includes lines "L11" and "L12" which should be relabeled ---E11--- and ---E12---, respectively. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

The specification incorrectly references Fig. 5A, Fig. 5B and Fig. 5C. For example, on page 26, line 12, "a serial interrupt mode as shown in Fig. 5B", however, it would appear the correct figure should be FIG. 5C; this same error occurs on page 27, line 16 and throughout the specification. Another example is on page 33, line 3, "the procedure of FIG. 5A (Step 421)---" should refer to FIG. 5C which is where Step 421 is shown.

These are only a few of the informalities in the specification, however the specification is replete with errors which incorrectly reference the wrong Figure as related to the discussions of figures 5A, 5B and 5C, starting on page 25 through page 34.

Appropriate correction is required.

Claim Objections

4. Claims 22, 23 and 24 are objected to because of the following informalities:

Claim 22, second line (part (h)) "determining data from said first unit received data from said second unit" is confusing. It appears the limitation is trying to determine if the first unit has received data from the second unit, however this can not be determined by the claim language.

Claim 23, line 5, "relinquishing own data transmission right", it cannot be determined what "own" is referencing. Should this be ownership? It cannot be determined what was intended to be claimed.

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Claim 24, line 7, "determined that said second has", it appears "said second" lacks antecedent basis and should be ---said second unit--- Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 21, lines 2-3 which correspond to step (e) claims the exact step in claim 19 step (c), followed by step (f) wherein the data transmission right is assigned, however when comparing fig. 5A it appears that both step (c) of claim 19 and step (e) of claim 21 correspond to decision block 317 where if data is to be transmitted then Data Transmission Right is Assigned. However, if this is the case, then step (f) which assigns the data transmission right should be indicated after the decision block 317 with the decision of YES should be followed by this data transmission right assignment, however the only support in the specification are steps 319, 32, 323 and 325, none of which assign the data transmission right. Should step (e) follow the "NO" after step (b) in claim 19 wherein step (b) corresponds to decision block 303 in figure 5A, then step (e) could correspond to decision block 305 and step (f) could correspond to decision block 307?

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Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 11, 12, 16 and 19-30 are rejected under 35 U.S.C. 102(a) as being anticipated by Yamazato et al (U.S. Pat. No. 5,555,189).

Yamazato et al discloses an internal communications system and wiring for a refrigerator. Included is a control unit (20, fig. 8) and display (63, fig. 10). Yamazato et al also utilizes a single bi-directional line for data transmission which is the same as that used in the current application. This is seen in fig.3 of the application (see also page 14 of the specification) wherein the pins INTn, Tx and Rx are tied together which is similar to the pins shown in fig. 20 of Yamazato et al wherein the strobe output performs the same function as the INTn in the applications and the Communication line Input Buffer is the same as RX in the application and finally the Serial Output buffer 92 is the same as Tx of the application for a refrigerator and wiring. Further, as to claims 11, 12, 16 and 19-30, these procedures are disclosed by Yamazato et al as shown in fig. 23 and fig. 24 which show the method for controlling the operations in the main control unit and the secondary control unit respectively. Figure 25 of Yamazato et al discloses the method for dealing with contention and collision problems and assigning access rights. These figures when taken together disclose claims 11, 12, 16 and 19-30. Also refer to figures 32 and 33 of Yamazato et al.

As to claim 11, Yamazato et al discloses a method for controlling the operations of a refrigerator using a control unit 20 (fig. 8) to control sub-control units 25 and terminal unit 60 (fig. 10). Terminal 60 inherently displays the operating state of the refrigerator (col. 25, line 46-55) and includes keys for controlling the refrigerator, see fig. 10, terminal 60, display 63, key board 62 and col. 25, lines 28-39. Yamazato et al also discusses the method for communicating with the sub-control units 25 which inherently is the same method for communicating with the terminal 60, since terminal 60 has the same communication-use interface 61 (I/F circuit as used in the sub-control units 25) used in the main control section 20 (I/F circuit 24).

-“determining whether a right of data transmission is assigned to the external display device or to a control unit of the refrigerator”-, this is disclosed in Yamazato et al wherein all of the control units (main, sub-control, terminal) determine which device has control of the communication-use cable 36 by detecting the state of the communication-use cable and by the length of the mark 82 (mark is also the header, see col. 43, line 50 through col. 44, line 14 and fig. 25, S11, S112, S113, S114 and S115).

-“converting into serial data, a signal indicative of an operation state of the refrigerator when the data transmission right is assigned to the control unit; converting, into serial data, a key input signal when the data transmission right is assigned to the external display device”-, this is inherent in the device of Yamazato et al since all communications between control units is via serial transmission as disclosed by the

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Serial Output Buffer 92 which is connected to the communication-use line 36 and is a component (i.e., the Serial Output Buffer 92) of each of the I/F circuits 24. It is inherent that the information manipulated by the microprocessors in each of the control units must have their data converted into serial data, to be loaded into the Serial Output Buffer 92 for communication to the control unit. This process would also include key data which is converted into serial data for transmitting to the control unit, col. 26, lines 15-25.

-“outputting the resultant serial data; and” -, once the transmission right is assigned, the serial data in the Serial Output Buffer 92 is output.

-“decoding the resultant serial data, and executing a control based on the decoded data”-, this is inherent in the system of Yamazato et al wherein the commands and data received in serial form, from the various control units and display terminal 60, must then convert or decode the command/data for processing by the microprocessor 22.

As to claim 12, “A method for controlling an external display device, comprising:” see discussion of claim 11 above.

-“determining whether or not there is data to be transmitted”-, this is disclosed by the transmission of the mark 82 (header) which means the control unit has data/commands to be transmitted.

-“checking whether or not a right-of data transmission is assigned; and transmitting, if it is determined that there is data to be transmitted, the data when there

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is a data transmission right assigned; executing a procedure for requesting the data transmission right when there is no data transmission right"-, is disclosed by Yamazato et al wherein each system checks the state of the communication-use cable 36 to determine if the cable is being used (therefore assigned), see col. 43, lines 40-43 and fig. 25, S113 and S114. If the check for the state of the communication-use cable 36 (i.e., the check for the right of data transmission) is OK the controller will transmit the data (i.e., if the communication line low level is "NO", S114, fig. 25, then the device as right of transmission and can therefore transmit the data, S116, S117, S118, S119). However, when there is no data transmission right the system executes a procedure for requesting the data transmission right, which is disclosed by the procedure shown in fig. 25, wherein the device does not have data transmission right (S115, Collision! Stop Transmission) followed by the procedures S111, S112, S113 and S114 which again trays to request transmission right, see col. 43, line 40 through col. 44, line 14.

As to claim 16, the system of Yamazato et al will determine if data has been received properly by sending an ACK code that tells the other controller that the data has been received properly. As to continuously executing, once the controller has the data transmission right, it will stay in this mode until it transmits the appropriate end of message code (space 85, col. 39). As to processing the data when there is no data transmission right, the system of Yamazato et al receives data and stores it in the Communication Line Input Buffer 91 (fig. 20) wherein the state of the right of transmission for that device is not assigned because it is receiving data. Further, once

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the data is stored in Buffer 91, the microprocessor of that control unit can process the data irregardless of the mode of the transmission line.

As to claim 19, the first and second units can be any of the sub-control units, main control or terminal display control units, see previous discussions. As to "(a) determining if said first unit is in a data transmission mode", this is disclosed by Yamazato et al wherein one of the units raises the mark 82 (header) which means the units is trying to go into a data transmission mode. As to "(b) determining if there is data to be transmitted if, in step (a), it is determined that said first unit is not in said data transmission mode", is disclosed by the fact that once the mark 82 is raised then the first unit has data to be transmitted, however another unit has the data transmission right, this is shown in fig. 25, wherein the Start Transmission of the Mark S112 indicates that data is to be transmitted, however since the Communication Line Low Level S114 is Yes then it is determined that the first unit is not in a data transmission mode. As to "(c) determining if said first unit has a data transmission right if, in step (b), it is determined that said first unit has said data to be transmitted", again this is disclosed by the attempt to Start Transmission of Mark S112, that is, when ever a Mark 82 is transmitted the unit has data to be transmitted. As to "(d) transmitting said data to said second unit if, in step (c), it is determined that said first unit has said transmission right", is disclosed by S116, S117, S118, S119 of figure 25 wherein once the Mark 82 is raised S112 and if the Communication Line Low Level is "NO" then the first unit has transmission right, see col. 43, line 16 through col. 44, line 30.

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As to claim 20, Yamazato et al includes a format of transmission which includes a header (Mark 82), a command (Command 84), data appended to the command (datum, 86 and wherein the data is some times include in the command, "The command 84 in the message called out from the sub-control section 25 includes datum corresponding to a change in a signal value of the input unit ...", col. 40, lines 9-11) and a trailer indicating a transmission ending (space 85), see col. 39, lines 7-10, lines 30-27, and lines 58-64.

As to claim 21, "(e) determining if said first unit has a data transmission right if, in step (b), it is determined that said first unit has said data to be transmitted", and "(f) determining if said data transmission right should be assigned to said first unit if, in step (e), it is determined that said first unit has said data transmission right" is disclosed in Yamazato et al as shown in fig. 25 wherein after part (b) in claim 19 the determination as to whether the first unit has data to be transmitted is disclosed by the raising of the "Start Transmission of Mark S112 and the determination of a data transmission right is disclosed by step S114 and S116 wherein the determining if data transmission right should be assigned (part (f)) is performed in step S114 and S116, which gives the data transmission right to the first unit. As to "(g) transmitting said data to second unit if, in step (f), it is determined that said first unit should be assigned said transmission right", is disclosed by steps S116, S117, S118, S119 (fig. 26) wherein the data transmission right has been assigned and the first unit has commenced data transmission to the second unit.

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As to claim 22, "(h) determining data from the first unit received data from said second unit", as can best be understood, the various microprocessors used in the units (control units) of Yamazato et al will determine the data and commands received from the various other units. As to steps (i), (j), (k) and (l), Yamazato et al discloses that information or data received from the second unit is stored (j) in the "Communication Line Input Buffer" 91, so data was received by the second unit it would be stored in buffer 91 even though the first unit has a data transmission right (i) (i.e., data in the Serial Output Buffer" 92 is being transmitted from the first unit to the second unit). As to determining if further data is to be transmitted and as to continuously executing communication if there is further data to be transmitted, it is inherent in the system of Yamazato et al that until the end of transmission (space 85, trailer ending transmission) the first unit will have both 1) further data to be transmitted and 2) will continuously transmit the data until it is complete.

As to claim 23, (m) again once a control unit raises the mark 82, it is requesting access to the communication-use line, i.e., it is requesting data transmission right. Once the trailer space 85 indicating the end of transmission (n), the system determines that the first unit does not have further data to be transmitted and then relinquishes the data transmission right (which then goes back to the start of fig. 25 to determine who has data transmission rights).

As to claim 24, (o) analyzing command received is disclosed by Yamazato et al wherein the header of mark 82 (which is similar to a command) is analyzed to determine which unit has data transmission right (step S112, S114). As to (p),

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determining if said second unit has relinquished its data transmission right is disclosed by the determinations made in steps S114 and S115 wherein in step S115 the second unit has relinquished its data transmission right. As to part (q), even though the second unit has relinquished its data transmission right, it will continue to request a data transmission right (see steps S111, S112, S113, S114 and S115) wherein once the answer to S114 "Communication Line Low Level" is "NO", then the second unit will have data transmission right.

Further as to claims 22, 23 and 25, Yamazato et al in fig. 23 shows the communication processes for the main control section 20 and fig. 24 shows the communication processes for the sub-control section. As shown in figures 23 and 24, the second unit (main controller) polls the first units in step S73 which is an inquiry from the second processor as to whether first unit has data available to be transmitted (claim 25 (r)), col. 40, lines 55-65. Then the (claim 25 (s)) determining if said first unit has data to be transmitted is determined in the first unit is disclosed by steps S96 and S97 wherein it is determined if this data needs to be sent. Then the system sends data from the first unit to the second unit step S98, S99 and S74. As to the claimed (t) and (u) steps, the determining and requesting of a data transmission right is disclosed by the process shown in fig. 25 of Yamazato et al and described previously. Further, as to claims 22-25 see fig. 23 and 24 with fig. 25 showing the method for assigning the data transmission right.

As to claim 26, this is disclosed by S78, S81 and S82.

As to claim 27, fig. 25 determines (a) which unit has right of transmission on the communication-use line along with the main unit (second unit) polling the first units (see fig. 23 S73 and S75 which determine if the first unit is in a reception mode. The first units determine the end of transmission signal is received by determining the reception of the end of transmission control 85, claimed (b). Further, claimed (c) it is inherent that once the first unit has data transmission right control, all of the data can be transmitted before it sends the end of transmission control bits 85. As to part (d), it is clear that received data is stored in the "Communication Line Input Buffer" 91.

As to claims 28-30, see previous discussions and figures 23, 24 and 25 of Yamazato et al., see col. 39-44.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-4, 6, 8, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazato et al (U.S. Pat. No. 5,555,189) in view of Marcade et al (U.S. Pat. No. 4,646,528).

As to independent claims 1 and 3 Yamazato et al teach an external display device 60 (fig. 10) for a refrigerator. Included is a display unit 63 (fig. 10), a control unit

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20 (fig. 8) and a communication-use interface 24 for bi-directional communications. The interface circuit 24 is provided in both the control unit 20 (see fig. 8) and in the external display device (60, element 61 I/F circuit for bi-directional communications, see col. 16, lines 47-54 and col. 25, lines 31-36). The control unit 20, via communication-use interface 24, converts commands and data into serial data to be transmitted to the display unit 60, wherein the communication-use interface in display unit 60, converts the serial data to display the data (see col. 25, lines 35-39) wherein it is inherent that the display commands sent from the control unit 20 to the display unit 60 are display control signals. Further, as to claim 3, Yamazato et al also teach a key input at the display unit, shown in fig. 10, keys 62. The communication-use interface in the display unit 60 converts the key information to serial data for transmission to the control unit 20, wherein the communication-use interface in the display unit also decodes serial display control information from the control unit 20, for display, see col. 25, lines 23-39 and col. 26, lines 15-28.

Yamazato et al does not teach the display unit being mounted to an outer case of the refrigerator.

Marcade et al shows an example of a display unit 34 mounted to the door of a refrigerator. The display unit 34 includes keys 36 and displays 40, see fig. 2 and col. 3, lines 38-47.

It would have been obvious to one of ordinary skill in the art at the time of the invention to mount the display disclosed by Yamazato et al on the door of the refrigerator as suggested by Marcade et al. This would have been obvious to allow the

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user to program the operation of the refrigerator, to allow the user to check the operation of the refrigerator (e.g., temperature of the various compartments, power saving and various modes) as well as making it easier to trouble shoot problems with the refrigerator by a repairman. Marcade et al also provides motivation for adding the display to the door of the refrigerator so as to allow the consumer to program his/her refrigerator for a vacation mode, etc, see col. 1 and 2 of Macade et al.

As to claim 2, "the display unit converts a plurality of key input signals into serial data and outputs the serial data to the control unit", is disclosed by Yamazato et al wherein "a key board 62 is operated for reading various data (S 22). Based on the operations of the key board 62, the microcomputer of the terminal unit 60 transmits a header, node address, and a command to the main control unit 20..." (col. 26, lines 16-20) wherein the command sent to the control unit 20 decodes the transmitted key entry and executes a control (in this case "...so as to instruct it (the control unit 20) to transmit various data.." (col. 26, line 19). Further, these key input signals are transmitted serially by the communication-use interface circuit 61 of the display, see col. 25, lines 31-37 and fig. 20, serial output buffer 92.

As to claims 17 and 18, the display unit 60 has a first microprocessor (col. 25, lines 31-32) and the control unit 20 includes a second microprocessor (22), see fig. 8.

As to claim 4, the display unit 60, includes an auxiliary control unit which receives commands from the control unit 20, which is disclosed by the CPU and communication-use interface contained within the display unit 60, see col. 25, lines 31-34.

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As to claim 6, the voltage supply line for supplying a supply voltage to the control unit and the auxiliary control unit is shown in Fig. 8 of Yamazato et al wherein the power plug 18a includes a supply voltage line connected to the control unit 20 (see power circuit 21) and to connector 50 which connects to the auxiliary control unit of the display unit 60.

As to claim 8 the communications system of Yamazato et al includes a communication-use interface for bi-directional communications, wherein the transmissions include a data format which includes a header portion (mark 82), a command portion (command 84) a data portion (datum 86) and a trailer portion (85, tail of the message), see fig. 21 and col. 39, lines 23-64.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazato et al in view of Marcade et al as applied to claim 8 above, and further in view of Ledbetter (U.S. Pat. No. 4,821,530).

The combination of Yamazato et al and Marcade et al suggests wiring to an external display device mounted on the door of a refrigerator through the hinge of the door as shown in fig. 1 of Marcade, (note the dashed line through the hinge of the door to unit 32). However, the combination of Yamazato et al and Marcade could be questioned as to the claimed specifics of the "hinge hole" etc, therefore Ledbetter is cited to specifically show this well known feature.

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Ledbetter specifically teaches passing a cable through a hole in the hinge of a refrigerator as shown in fig. 9, cable 84 through hollow hinge 72, 78, 80, see col. 3, lines 24-50 and figures 9 and 10.

It would have been obvious to wire the external display of Yamazato et al and Marcade et al by passing voltage supply and/or data signal lines through a hole in the door hinge of the refrigerator to prevent wear on the connecting wires. That is, as suggested by Ledbetter, by passing the wires through a hole in the hinge flexing of the cables will be reduced, see col. 3, lines 46 which will reduce the possibility of the wires breaking for being damaged.

11. Claims 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazato et al (U.S. Pat. No. 5,555,189) in view of Marcade et al (U.S. Pat. No. 4,646,528) and Ledbetter (U.S. Pat. No. 4,821,530).

Yamazato et al teaches user interface unit (60, fig. 10) for a refrigerator, which includes a display unit 63 and keyboard 62, see fig. 10. A control unit 20 (fig. 8) and a communication-use interface 24 for serial bi-directional communications between the user interface unit (60) are also taught by Yamazato, see previous rejection of claims 1 and 3.

Yamazato et al does not teach the display unit is mounted to a door of an appliance.

Marcade et al shows an example of a display unit 34 mounted to the door of a refrigerator. The display unit 34 includes keys 36 and displays 40, see fig. 2 and col. 3, lines 38-47.

It would have been obvious to one of ordinary skill in the art at the time of the invention to mount the display disclosed by Yamazato et al on the door of the refrigerator as suggested by Marcade et al. This would have been obvious to allow the user to program the operation of the refrigerator, to allow the user to check the operation of the refrigerator (e.g., temperature of the various compartments, power saving and various modes) as well as making it easier to trouble shoot problems with the refrigerator by a repairman. Marcade et al also provides motivation for adding the display to the door of the refrigerator so as to allow the consumer to program his/her refrigerator for a vacation mode, etc, see col. 1 and 2 of Marcade et al.

The combination of Yamazato et al and Marcade et al suggests wiring to an external display device mounted on the door of a refrigerator through the hinge of the door as shown in fig. 1 of Marcade, (note the dashed line through the hinge of the door to unit 32). However, the combination of Yamazato et al and Marcade could be questioned as to the claimed specifics of the "hinge hole" etc, therefore Ledbetter is cited to specifically show this well known feature.

Ledbetter specifically teaches passing a cable through a hole in the hinge of a refrigerator as shown in fig. 9, cable 84 through hollow hinge 72, 78, 80, see col. 3, lines 24-50 and figures 9 and 10.

It would have been obvious to pass the serial communication line of Yamazato et al (cable 36, fig. 8) as well as DC power cable 35 and AC cable 18 through the hinge of the refrigerator door as suggested by Marcade et al and as positively cited by Ledbetter. As suggested by Ledbetter, by passing the wires through a hole in the hinge flexing of the cables will be reduced, see col. 3, lines 46 which will reduce the possibility of the wires breaking for being damaged.

As to claim 32 "wherein said appliance is a refrigerator", all three references, Yamazato et al, Marcade et al and Ledbetter are directed to refrigerator appliances.

As to claim 33, the interface unit 60 of Yamazato et al includes a display unit 63 and a key entry unit 62.

As to claim 34, the interface unit having a microprocessor, this is disclosed by Yamazato et al in col. 25, line 31.

As to claim 35, the control unit having a microprocessor, this is disclosed by Yamazato et al as shown in fig. 8, microcomputer 22.

As to claim 36, the serial communication line being a bi-directional line is disclosed by Yamazato et al, see col. 25, lines 33-34.

12. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazato et al (U.S. Pat. No. 5,555,189) in view of Marcade et al (U.S. Pat. No. 4,646,528) and Ledbetter (U.S. Pat. No. 4,821,530) as applied to claim 31 above, and further in view of Olek (U.S. Pat. No. 4,729,126).

Art Unit: 2675

Yamazato et al teaches a single wire, bi-directional line, for communicating data in an asynchronous serial fashion, however Yamazato et al does not teach the claimed four-wire asynchronous serial communication system.

Olek teaches a four-wire asynchronous serial communication system, see col. 9, line 61 through col. 10, line 23, and figure 4, lines 236, 263, 273 and 282.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the single-wire bi-directional asynchronous serial communication system of Yamazato et al, Marcade et al and Ledbetter because the four-wire communication system would simplify the contention or collision problem addressed in Yamazato et al and would make the programming of the communication system simpler. Further, as shown in Olek, the four-wire is well known and would easily be added to the system of Yamazato et al without adding too many wires to be placed through the hinge of Ledbetter.

13. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazato et al (U.S. Pat. No. 5,555,189) in view of Marcade et al (U.S. Pat. No. 4,646,528) and Ledbetter (U.S. Pat. No. 4,821,530) as applied to claim 31 above, and further in view of Sanchez (U.S. Pat. No. 5,748,684).

Yamazato et al teaches a single wire, bi-directional line, for communicating data in an asynchronous serial fashion, however Yamazato et al does not teach the claimed serial communication line being a synchronous five-wire system.

Art Unit: 2675

Sanchez teaches a five line synchronous interface, see fig. 2, and col. 3, lines 18-20 and col. 4, lines 12-15.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the single-wire bi-directional asynchronous serial communication system of Yamazato et al, Marcade et al and Ledbetter to a synchronous five-wire communication system to provide the benefits of a synchronous communication system which simplifies the contention and data collision problems of Yamazato's single wire bi-directional communication system. Further, Sanchez includes other benefits in that his system does not significantly reduce bandwidth and adding peripherals is easily done, see col. 2, lines 40-45, see also col. 1.

Response to Arguments

14. Applicant's arguments with respect to claims 1-4, 6-8, 11-12, and 16-38 which were filed in Amendment B, filed 2/7/00 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Parikh et al (U.S. Pat. No. 4,205,200) teaches a digital communications system utilizing controllable field size in a serial communication system.

Art Unit: 2675

Vander Meiden (U.S. Pat. No. 4,512,026) teaches a data format for asynchronous data transmission and includes a method for differentiating transmitted data and internal exchange signals.

DiMassimo et al (U.S. Pat. No. 4,536,759) teaches a multi-format data display which receives data display commands via a serial bus.

DiGiulio et al (U.S. Pat. No. 4,947,317) teaches a communication protocol for a three node system having dedicated connections and bit indicating function of exchanged messages and is capable of resolving transmission line content.

Heberle (U.S. Pat. No. 5,237,322) teaches a master-slave data transmission system employing a flexible single-wire bus.

Wilson et al (U.S. Pat. No. 5,150,359) teaches a multiplexed synchronous/asynchronous data bus using a three bus line to convey bi-directional synchronous data.

Whipple, III et al (U.S. Pat. No. 5,600,310) teaches a serial bus control for appliances using a master-slave control method.

Overtom et al (U.S. Pat. No. 5,835,785) teaches a multiplexed three line synchronous/full-duplex asynchronous data bus used to convey bi-directional data.

Prill et al (U.S. Pat. No. 5,848,072) teaches a data-transmission system including a master device and at least one slave device wherein the address is communicated synchronously and the data is communicated asynchronously.

16. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Fritz Alphonse whose telephone number is (703) 308-8534.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven J. Saras can be reached on (703) 305-9720.

Any response to this actions should be mailed to:

Commissioner of Patents and Trademarks
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or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office, telephone number (703) 306-0377.



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F.A.
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